

# Supporting Information

## **Reactive adsorption desulfurization on Cu/ZnO adsorbent: effect of ZnO polarity ratio on the selective hydrogenation**

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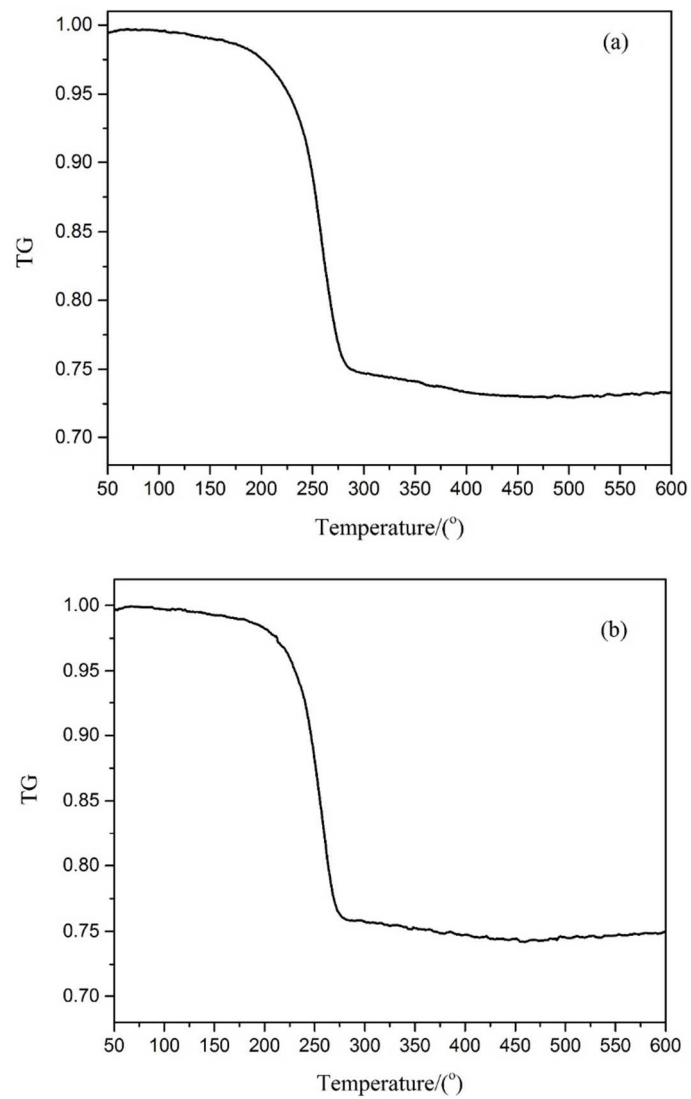
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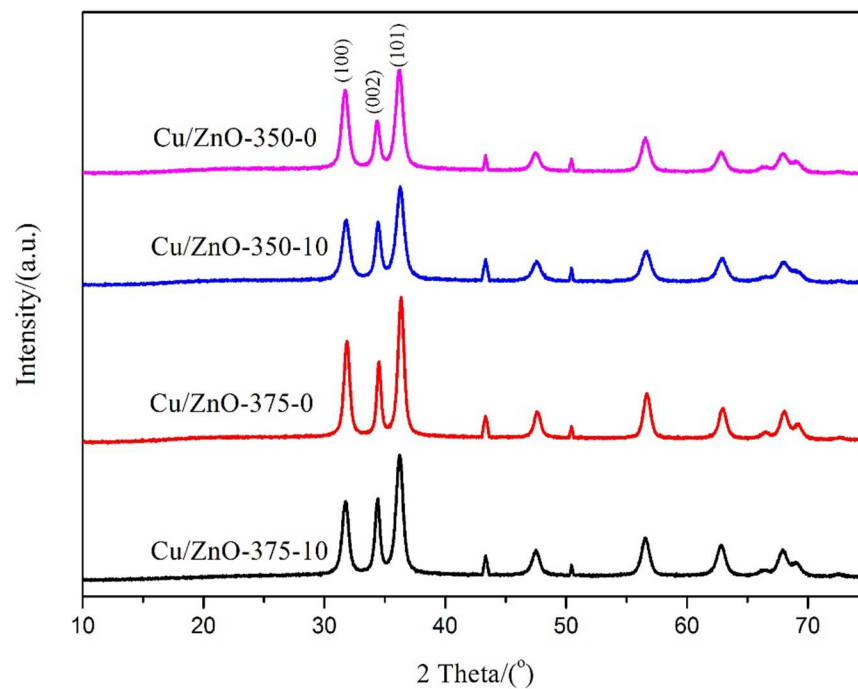
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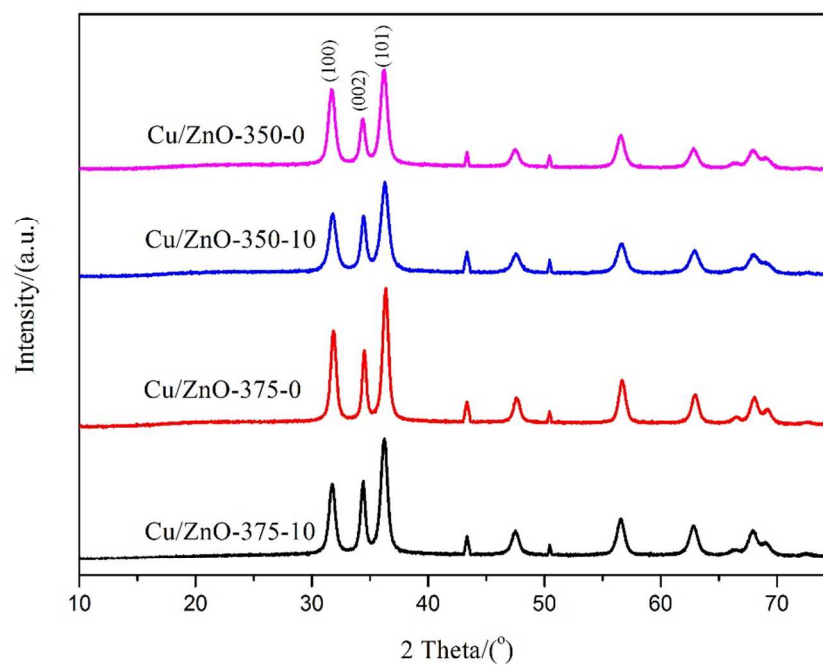
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**Figure S1** the TG patterns of ZnO precursor (a) addition  $P_{123}$ ; (b) no addition  $P_{123}$



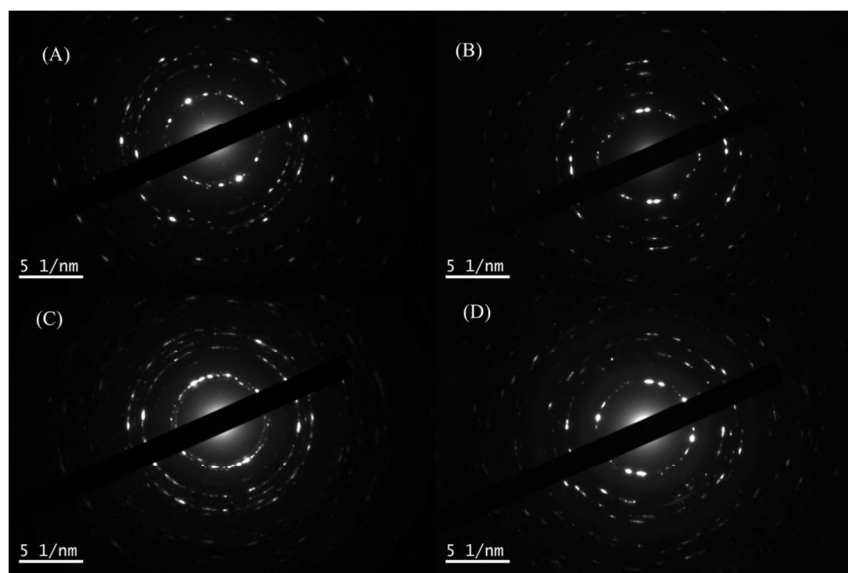
**Figure S2 XRD patterns of the reduced Cu/ZnO adsorbents**



**Figure S3 XRD patterns of the spent Cu/ZnO adsorbents**

**Table S1 the crystal diameter for (100), (002) and (101)**

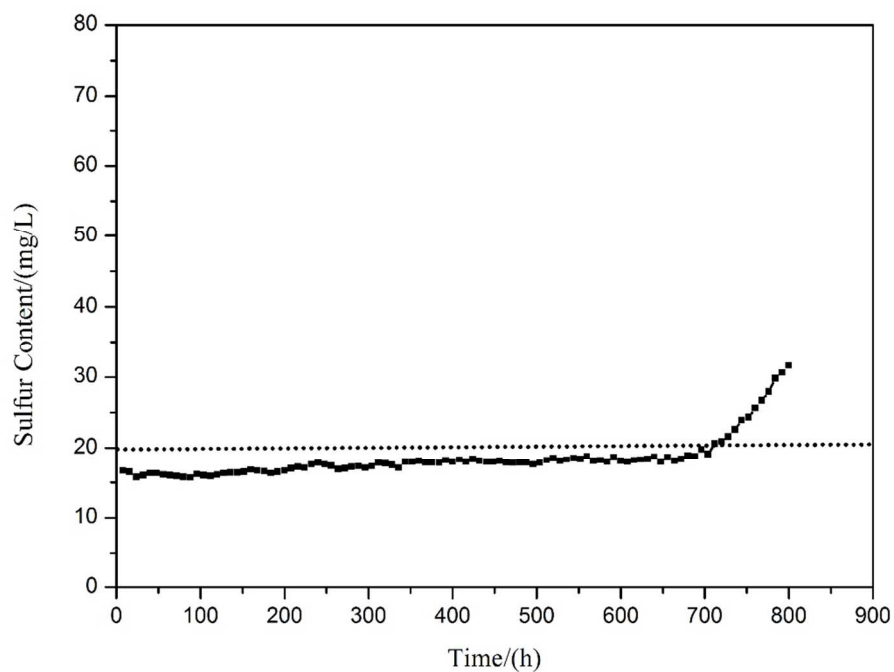
Crystal	ZnO <sub>375-10</sub>	ZnO <sub>375-0</sub>	ZnO <sub>350-10</sub>	ZnO <sub>350-0</sub>
Diameter (nm)				
100	20.9	17.8	17.8	70.9
002	46.5	33.8	51.3	58.6
101	15.8	51.6	18.1	16.7



**Figure S4** the SAED images of the ZnO supports, (A)ZnO<sub>370-10</sub>; (B)ZnO<sub>370-0</sub>; (C)ZnO<sub>350-10</sub>; (D)ZnO<sub>350-0</sub>;

**Table S2 the properties of FCC gasoline and the product of Cu-based catalyst and Ni-based catalyst**

	Density /(g/cm <sup>-3</sup> )	sulfur content (mg/L)	paraffin	olefin	Naphthe nic	Aromati c
FCC gasoline	0.73	103.3	41.52	16.19	7.37	32.92
Copper-based Product	0.73	<20	46.07	14.14	8.88	30.91
Nickel-based product	0.73	<20	66.14	4.92	7.79	21.15



**Figure S5 the curve of the breakthrough of the Cu/ZnO catalyst**